



Habitat Expansion Agreement

for

Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead

Questionnaire Instructions

The attached questionnaire is intended to solicit information needed by the Steering Committee to review projects relative to the criteria established in the Habitat Expansion Agreement. For each proposed action (project), please complete the questionnaire to the fullest extent possible. Please provide citations where applicable and provide a full reference for each citation at the end of this questionnaire (Section X. Supporting Documents). Specific instructions follow.

I. Contact Information

Provide the name of the agency or group making the proposal as well as a contact person for the project. Include contact information such as mailing address, phone number, and email address.

II. Project Description

Provide a descriptive name for the action (project). If the action is listed in the *Working List of Potential Habitat Expansion Actions* (provided during the January 2009 meetings of HEA parties), please include the reference number associated with the action. The project location should specify the watershed or subwatershed (e.g., Deer Creek, Beegum Creek) as well as specific areas within the watershed where the project will be located and what portions of the watershed will benefit from the project. Please include geographic coordinates of the project location(s), if applicable. The project description should be a narrative that provides as much detail as possible about the project.

III. Species Limiting Factors

In this section, indicate the factors that currently limit production of spring-run Chinook salmon and/or steelhead in your watershed. The intent is that the environmental and biological objectives of your project address these limiting factors in some way. Please check one or more of the limiting factors that apply to your watershed. In the second column, describe how and where the factor limits spring-run Chinook salmon and/or steelhead. For each factor that you check, please rank its effect on spring-run Chinook salmon and/or steelhead using the drop-down box in the last column. Finally, we also ask that you describe the source of your conclusions, such as a watershed assessment or other document. Please provide enough information that we can find the document if we need it.

IV. Project Objectives—Environmental

Environmental objectives describe how the project is intended to address the limiting factors to achieve the biological objective described in the next section. Environmental objectives should be as specific and quantitative as possible (e.g., reduce gravel embeddedness in the watershed from 75% to 25% by fencing riparian areas to exclude cattle and allow riparian forest to reestablish). Describe how you think environmental objectives relate specifically to the biological objectives. In the last column, we ask you to describe the environmental objectives as either the primary or secondary focus of the project. For example, a project to plant trees might have a primary focus on riparian/floodplain function with a secondary focus on temperature or water quality.

V. Project Objectives—Biological

Biological objectives describe the anticipated biological response from the project and should be as quantitative as possible. Indicate which species and life stages are the focus of the project. Describe specifically the general condition of the target species in your watershed relative to the historical abundance. The condition of the species should be indicated using the categories in the drop-down box. Species condition categories are defined on the last page of this form. Biological objectives should include the following information: (1) an estimate of the expected contribution of the project in terms of potential adult returns, to the extent possible (and an explanation of how the estimate was developed); and (2) an explanation of how the biological objective for the species is addressed by the action relative to the environmental limiting factors (e.g., the biological objective of an action might be to increase egg incubation survival in a watershed that is currently limited by sediment levels).

VI. Project Cost

To the extent possible, estimate the capital cost of the project, the annual operating and maintenance (O&M) cost, a description of annual O&M activities, and the project lifetime (i.e., how many years O&M activities are expected, including indefinitely, and how long until you expect the project to provide benefits). Provide any confirmed or potential funding partners, or opportunities for cost sharing with other funders or between projects. Also, identify any confirmed or potential partners that might provide maintenance support for the project (funding support or labor support).

VII. Schedule

Describe the project schedule, including a potential start date, construction period, and environmental and biological response times (i.e., the expected time to realize environmental and biological benefits). The last points refer to the maturation period for the project during which time environmental conditions develop. For example, it may take 50–100 years before full environmental benefits (e.g., shading, channel stability, water quality) of planting riparian trees are realized.

VIII. Feasibility

Describe the feasibility and challenges of the project. Feasibility issues should include primarily technical issues, success of projects utilizing similar technology, and particular challenges posed by the specific project. Other issues of feasibility that may be included are challenges associated with property ownership, permitting, zoning, and other social-economic-legal issues.

IX. Project Support

Describe the support or potential conflicts associated with the project. Specifically, provide supporting and cooperating entities (e.g., agencies, non-governmental organizations). Are there cooperating agencies or groups, aside from the potential funding partners mentioned previously? Describe the degree of local support and any known opposition or conflicts with other parties.

X. Supporting Documents

Provide full references for each citation used to support the information presented in this questionnaire for your project. At a minimum, a reference should include the author(s) name; name of agency/organization (if applicable); title of the document; volume and title of journal, if the document is taken from a professional journal; and publisher, date, and location of publication.



Questionnaire

for

Information on Potential Projects to Support Spring-Run Chinook Salmon and Steelhead in the Sacramento River Basin for the Habitat Expansion Agreement

DUE: Thursday, April 30, 2009

Send completed questionnaires to hea@water.ca.gov

I. Contact Information

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II. Project Description

Project Name: Iron Can yon Fish Ladder Rehabilitation
Reference No. or New: New
Project Location: Iron Canyo, Big Chico Creek, Chico, Butte County
Project Description:

Rehabilitate existing weirs and install new weirs to provide consistent access to holding and spawning habitat at low to moderate flows.

III. Species Limiting Factors

In this section, describe the limiting factors for spring-run Chinook salmon and steelhead in your watershed. The last page of this questionnaire defines the limiting factors.

<u>Limiting Factors</u>	<u>Description (from back page)</u>	<u>Rank</u>
<input type="checkbox"/> Channel Form		Select Rank
<input type="checkbox"/> Channel Unit Types		Select Rank
<input type="checkbox"/> Substrate		Select Rank
<input type="checkbox"/> Structure		Select Rank
<input type="checkbox"/> Flow		Select Rank
<input checked="" type="checkbox"/> Temperature	Temperature below Iron Canyon lethal.	High
<input type="checkbox"/> Water Quality		Select Rank
<input checked="" type="checkbox"/> Passage	Iron Canyon boulders obstruct adult passage in low to moderate flow years. Flood control structures can affect adult and juvenile passage.	High
<input checked="" type="checkbox"/> Riparian/Floodplain	Urban land use, agricultural land use and flood control modifications have degraded riparian habitat in valley reaches.	Medium

Source Documents:

Big Chico Creek Watershed Alliance, undated.

Additional Notes:

IV. Project Objectives—Environmental

In this section, describe how your project will affect one or more of the limiting factors for spring-run Chinook salmon or steelhead described above.

<u>Limiting Factor</u>	<u>Description and Objective</u>	<u>Focus</u>
<input type="checkbox"/> Channel Form		Select Focus
<input type="checkbox"/> Channel Unit Types		Select Focus
<input type="checkbox"/> Substrate		Select Focus
<input type="checkbox"/> Structure		Select Focus
<input type="checkbox"/> Flow		Select Focus
<input type="checkbox"/> Temperature		Select Focus
<input type="checkbox"/> Water Quality		Select Focus
<input checked="" type="checkbox"/> Passage	Project will restore adult passage at low and moderate flows to reach	Primary

IV. Project Objectives—Environmental

holding, spawning and rearing habitat.

☐ **Riparian/Floodplain**

Select Focus

V. Project Objectives—Biological

In this section, describe the objective(s) of your project relative to the goal of providing habitat for spring-run Chinook salmon and steelhead. Indicate the species and life stage that are targeted by the project. (It is okay to have more than one species/life stage target).

Target Species: ☒ Spring-Run Chinook Salmon **Population Status Specific to Watershed:** Intermittent

Target Life Stages:

☒ Spawning ☐ Egg Incubation ☒ Summer Rearing ☒ Winter Rearing
☐ Juvenile Emigration ☒ Adult Immigration ☒ Adult Holding

Description of Project Objectives:

The estimated escapement of spring-run Chinook is highly variable, ranging from 0 in low flow years to almost 400 in high flow years. Repairing the fish ladder would improve spring-run Chinook access to the existing habitat over a broader range of flows thereby increasing escapement in more years. Therefore one purpose of this project is to increase escapement of spring-run Chinook in Big Chico Creek by improving upstream passage to summer holding, spawning and rearing habitat.

Target Species: ☒ Steelhead **Population Status Specific to Watershed:** Intermittent

Target Life Stages:

☒ Spawning ☐ Egg Incubation ☒ Summer Rearing ☒ Winter Rearing
☐ Juvenile Emigration ☒ Adult Immigration

Description of Project Objectives:

Steelhead escapement to Big Chico Creek is currently unknown but historically steelhead were observed in Big Chico Creek. Improvements to the fish ladder would improve access to spawning and juvenile rearing habitat. Therefore another purpose of this project is to increase escapement of steelhead in Big Chico Creek by improving upstream passage to spawning and rearing habitat.

VI. Project Cost

Capital Cost: \$2,114,218 (HDR, 2007, adjusted for 2010 construction costs, grant administration, public outreach and extended construction period for concrete curing)

Annual Operation and Maintenance Cost: unknown

VI. Project Cost

Annual Operation and Maintenance Description:	Routine operation and maintenance will include inspection, removal of debris, adjustment of flow where possible and small repair such as patching walls where broken or damaged, and other minor repairs necessary to keep fish moving through the ladder (DFG, personal communication)
Project Lifespan:	50 years (HDR and Sage, 2006)
Project Partners (Funding):	USFWS-AFRP (design and environmental compliance)
Project Partners (Maintenance):	DFG (routine operation and maintenance as described above)

VII. Schedule

Proposed Start:	Bid package fall, 2009, award April 2010, mobilize June 1, 2010
Expected Time to Completion:	Complete in channel October 15, 2010, site restoration and contract complete December, 2010
Expected Time to Realize Environmental Benefits:	Spring, 2011
Expected Time to Realize Biological Benefits:	Spring, 2011

VIII. Feasibility

Technical Feasibility:	Project selected by agency technical team as preferred alternative (Department of Water Resources, 2002). An evaluation of Iron Canyon for the USFWS was conducted in 2006. Based on the results there was nothing identified geologically, seismically, structurally, or hydraulically to preclude construction of the ladder (HDR and SAGE, 2006).
Technical Challenges:	The work site is located in a steep-walled canyon so site access poses a challenge. There is also a low to moderate risk of a block topple or slide and/or compression failure of sections of the canyon walls. These challenges were addressed in the 2006 evaluation of Iron Canyon.
Related Projects:	Agricultural pumps were moved from mouth of Big Chico to Sacramento River to protect juvenile outmigration. Inflatable dam installed at 1-Mile on Big Chico Creek that can be adjusted to improve passage for spring run and steelhead. Ecological Reserve established that protects 4,000 acres of watershed and 4.5 miles of spring run stream habitat.
Ownership or Permitting Challenges:	CEQA complete. Permitting underway, expected to be complete by fall, 2009.
Conflicts with Cultural, Zoning, or Other Issues:	Cultural resources survey documented no cultural conflicts. Project is consistent with City of Chico planning documents.

IX. Project Support

Supporting Entities:	City of Chico, CSU, Chico Research Foundation, Big Chico Creek Watershed Alliance
Cooperating Entities:	DFG, USFWS, NMFS
Degree of Local Support:	High
Known Opposition:	None

X. Supporting Documents

Please provide a full reference for each citation used to support the information presented in this questionnaire.

All documents except construction specifications can be found at
http://www.bigchicocreek.org/nodes/aboutwatershed/projectsprograms/iron_canyon_fish_ladder.htm

Big Chico Creek Watershed Alliance, undated. Existing Conditions Report. Chico, CA. Undated.

Department of Water Resources (2002). Iron Canyon and Bear Hole Fish Passage Project on Big Chico Creek, Preliminary Engineering Technical Report. Sacramento, CA. April 2002.

HDR (2007). USFWS - Iron Canyon Fish Ladder Project Construction Documents Project Manual. Prepared for USFWS. June 2007. Folsom, CA.

HDR and SAGE (2006). Evaluation of Iron Canyon for Proposed Fish Ladder Structure Repair and Construction Final Report. Prepared for USFWS Chico, CA. May 2006.

Definitions of Limiting Factors for Spring-Run Chinook Salmon and Steelhead

Channel Form

This attribute describes changes to the channel, including incision, aggradation, diking, armoring, and other modifications of the channel adversely affecting spring-run Chinook salmon and steelhead.

Channel Unit Types

Examples of geomorphic features of the channel that form habitat types for spring-run Chinook salmon and steelhead are pools, riffles, glides, and runs. This attribute describes changes in the frequency and size of such features. For example, removal of large wood may reduce the frequency of pools, presence of steps, or retention of gravel for riffles.

Substrate

This attribute describes changes in the composition of the substrate of the stream, including increase in fine sediment and lack of gravel recruitment.

Structure

This attribute describes the loss of structural elements in the stream such as large wood, boulders, undercut banks, and so on. Loss of structure results in a simplification of the channel and influences Channel Form and Channel Unit Types.

Flow

This attribute addresses modification of the flow regime, including decrease in summer low flow, increased “flashiness,” and dewatering of the channel as a result of withdrawals.

Temperature

Change in water temperature can be attributable to human actions such as removal of riparian shading. This attribute describes the increase in summer water temperature and the loss of temperature refugia (springs or groundwater) as a result of human actions.

Water Quality

This attribute pertains to the input to the stream of toxins or pollutants that produce adverse impacts on spring-run Chinook salmon or steelhead. This can include chemical pollutants such as fertilizer and pesticides and nutrient sources such as cattle and feedlots.

Passage

This relates to the effect of impediments to adult or juvenile migration of spring-run Chinook salmon or steelhead, including dams, culverts, channel dewatering, and other structural and channel modifications. Please describe the location of the passage impediment and describe the extent of impediment (i.e., a complete or partial blockage to migration).

Riparian/Floodplain

This attribute describes the loss of functionality of the riparian forest/vegetation and the connection of the stream to the floodplain during high water and flooding.

Population Condition Definitions for Section V. Project Objectives—Biological

Increasing

Adult returns of the target species to the watershed have generally been increasing over the last several years; expectations are that the species is displaying characteristics of a rebuilding or healthy population.

Stable

Adult returns of the target species to the watershed show no clear trend over the last several years.

Decreasing

Adult returns of the target species to the watershed are declining over the last several years; the decline in abundance is a cause of concern and characteristic of a potentially unhealthy population.

Intermittent

Adult returns of the target species are occasionally seen in the watershed, but there is no viable or sustained population in the basin.

Extirpated

The population has been eliminated from the watershed although the species was present in the past.

Never Present

The species has never been known to occur in the watershed.